Plants Practice Test

Modified True/False
Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

____ 1. Losing excessive amounts of water through evaporation may affect a plant's ability to carry out photosynthesis. _____

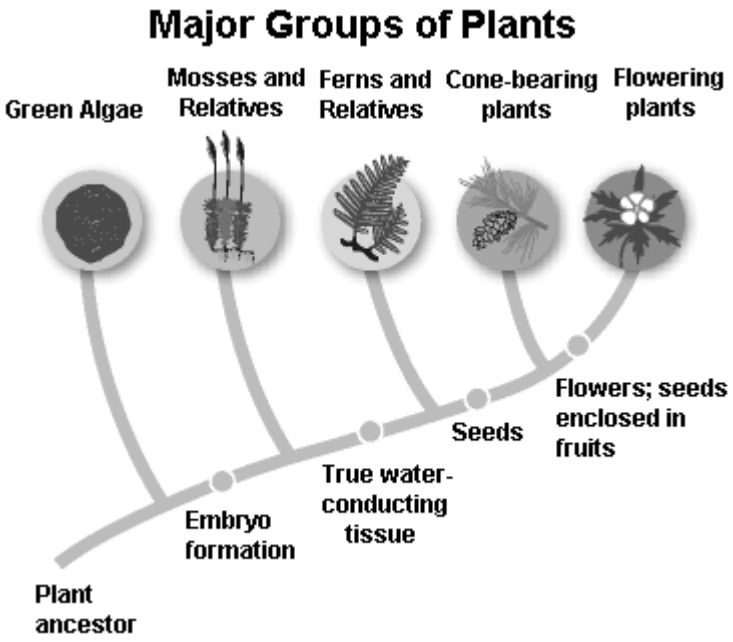

Figure 22–1

____ 2. Figure 22–1 shows the evolutionary relationships among the major plant groups living on Earth today. _____

____ 3. When you look at a mature gymnosperm or angiosperm, you see the more conspicuous gametophyte. _____

____ 4. The first plants on Earth were bryophytes. _____

____ 5. Many green algae form multicellular specialized tissues. _____

____ 6. A reason that bryophytes are small is that they lack vascular tissue. _____

____ 7. Xylem carries solutions of nutrients and food produced by photosynthesis. _____

____ 8. The key adaptation that enabled the earliest gymnosperms and angiosperms to live in dry environments was the spore. _____

____ 9. Flowers are characteristic of gymnosperms. _____

____ 10. In gymnosperms, gametophytes are encased in cones. _____

____ 11. Pollen cones are also called female cones. _____

____ 12. In angiosperms, the ovule becomes the fruit. _____

____ 13. An evolutionary advantage of flowers is that they attract pollinators. _____

____ 14. If a seed has two cotyledons, it will have fibrous roots. _____

____ 15. Biennials are pollinated during their first year of growth. _____

____ 16. In plants, the main organs in which photosynthesis takes place are leaves. _____

____ 17. Phloem is made up of vessel elements and companion cells. _____

____ 18. Meristems produce new cells by mitosis. _____

____ 19. Root hairs are made up of ground tissue. _____

____ 20. The high concentration of mineral ions in the plant cells causes water molecules to move into the plant by active transport. _____

____ 21. The area of a root through which water cannot pass is the epidermis. _____

____ 22. A bud contains ground tissue. _____

____ 23. The secondary growth of a dicot stem results from cell divisions in the stem's vascular cambium and xylem. _____

____ 24. In a tree, the heartwood is made up of older xylem that no longer conducts water. _____

____ 25. The thin, flat part of a leaf is called the petiole. _____

____ 26. Transpiration from leaves occurs because of the osmosis of water from the leaf to the environment. _____

____ 27. When the guard cells of a leaf lose water, the stomata open. _____

____ 28. In plants, the opening and closing of stomata balance water loss with the need for carbon dioxide. _____

____ 29. Water rises to the top of a giant redwood tree by transpirational pull. _____

____ 30. When plants pump nutrients from their roots to their branches, the roots contain the sink cells. _____

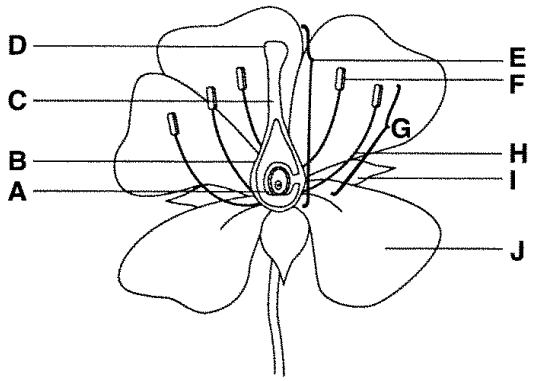

Figure 24–4

____ 31. In Figure 24–4, letters D, C, and A point to the female parts of a flower. _____

____ 32. In Figure 24–4, letter J indicates the carpel of the flower.

____ 33. Angiosperms are the only plants that undergo double fertilization. _____

____ 34. A plant cutting used for propagation should have one or more buds containing meristem tissue. _____

____ 35. A fruit almost always contains one or more seeds. _____

____ 36. Seeds that are dispersed by animals are typically contained in lightweight fruits. _____

____ 37. Some seeds go through a period of dormancy, during which they are alive but do not grow. _____

____ 38. Ethylene delay(s) the aging of leaves in plants. _____

____ 39. Cells on the shaded side of a stem elongate more than cells on the side receiving light because of the hormone ethylene. _____

____ 40. The tropism that allows seedlings to find their way out of the soil and into the sunlight is photoperiodism. _____

____ 41. The growing tip of a climbing vine exhibits phototropism when it coils around a stake. _____

____ 42. The orange and yellow colors of fall leaves are a result of the reduction of chlorophyll in the leaf, revealing phytochrome pigments. _____

____ 43. Long-day plants flower when nights are long. _____

____ 44. A grain cultivated as a food crop likely would have seeds with a large proportion of seed coat. _____

____ 45. People often use plants for building materials and medicines.

Completion
Complete each statement.

46. Plants need to exchange _____ in order to carry out the processes of photosynthesis and respiration.

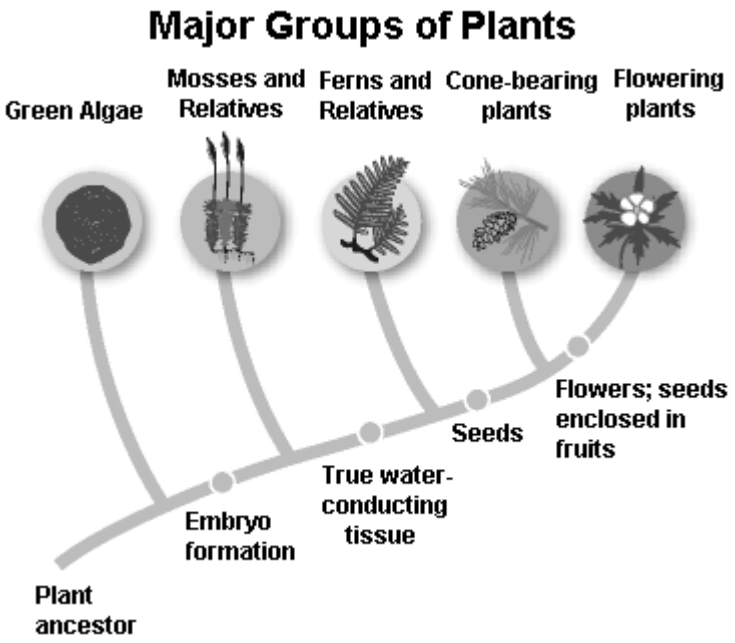

Figure 22–1

47. According to Figure 22–1, cone-bearing plants evolved before _____.

48. Figure 22–1 shows that plants evolved _____ before they evolved seeds.

49. The shift between phases in the plant life cycle is known as _____.

50. The life cycle of a plant shifts between a _____ phase and a _____ phase.

51. _____ include plants whose cells form multicellular groups but lack specialization.

52. Most photosynthesis takes place in the _____ stage of the moss life cycle.

53. The process by which bryophytes draw water into their cells from the environment is called _____.

54. Vascular plants are also known as _____ because of the specialized water-conducting cells they contain.

55. Most seeds can survive extreme heat for long periods because they have a(an) _____.

56. Two ovules lie at the base of each scale on a(an) _____.

57. The angiosperm _____ plays a major role in the dispersal of seeds.

58. Looking at the _____ pattern in a leaf can tell you if an angiosperm is a monocot or dicot.

59. Farmers must plant wheat each year because wheat is a(an) _____.

60. The stems of a(an) _____ do not form wood.

61. The three main organs of seed plants are roots, leaves, and _____.

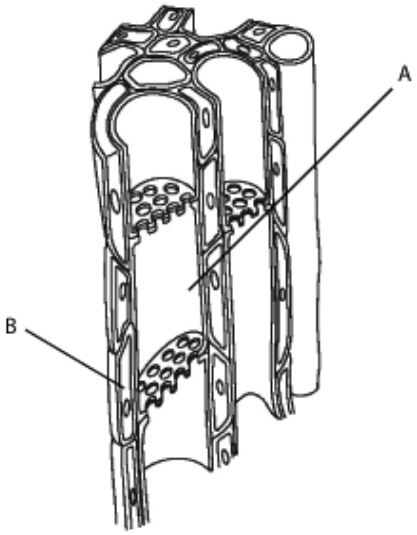

Figure 23–1

62. In Figure 23–1, letter A indicates the _____, through which nutrients move from cell to cell.

63. In xylem and phloem, the cells that keep their nuclei and organelles are the _____.

64. _____ at the tips of stems and roots produce rapid growth in plants.

65. In roots, _____ increase the surface area through which water and minerals can diffuse.

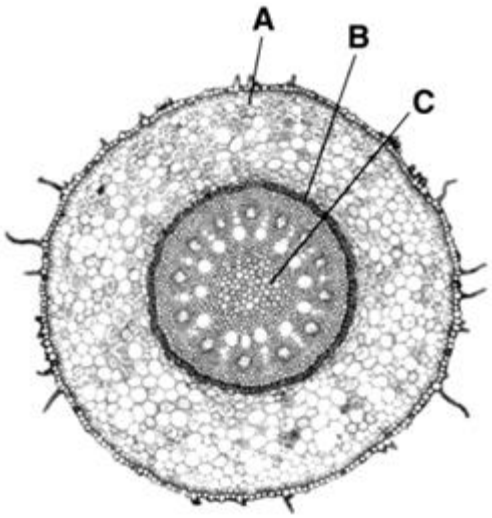

Figure 23–5

66. In Figure 23–5, structure B is the _____, which includes a waterproof zone called the _____.

67. As the relative concentration of mineral ions in a root's cells increases, the osmosis of water molecules into the root _____.

68. The _____ on a stem contain apical meristems that can produce new stems and leaves.

69. During _____, cells in the apical meristems become longer, adding to the length of roots and stems.

70. If a cross section of a tree has 12 tree rings, it is most likely _____ years old.

71. In conifers and dicots, the meristem that lies between the xylem and phloem is the _____, and the meristem that is part of the bark is the _____.

72. The air spaces in the _____ layer of a leaf connect with air through stomata in the epidermis of the leaf.

73. _____ control the opening and closing of stomata.

74. Capillary action is a product of both _____, which is the attraction of water molecules to each other, and _____, which is the attraction of water molecules to other kinds of molecules.

75. The _____ explains the movement of materials through phloem.

76. In a flower's stamen, the filament is topped by a(an) _____.

77. In angiosperms, the female gametophyte, or _____, is formed through meiosis and mitosis and consists of eight nuclei surrounded by a membrane.

78. In angiosperm fertilization, a triploid cell that eventually becomes _____ is produced by a second fertilization event.

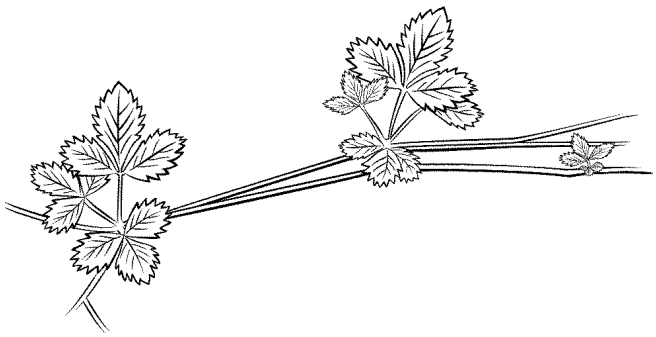

Figure 24–1

79. In the strawberry plant shown in Figure 24–1, new plants are growing from structures called _____.

80. Angiosperm seeds are surrounded by a mature ovary called a _____.

81. The seeds of fruits that are eaten by animals have tough _____.

82. Many lightweight seeds are dispersed by wind or _____.

83. A seed that is dispersed far away from the parent plant may be more successful because it faces no _____ from the parent plant.

84. Extreme environmental conditions such as heat and cold may affect the timing of a mature seed's _____.

85. Fruit ripening can be stimulated by _____.

86. The production of _____ in root tips balances out the effects of _____, which are produced in apical meristems.

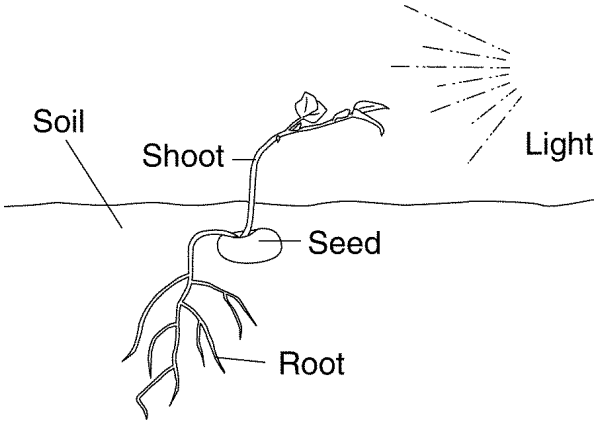

Figure 24–3

87. In Figure 24–3, the response of the bean seedling's roots is due to _____.

88. A plant pigment called _____ is responsible for plant responses to increasing or decreasing day length as the seasons change.

89. The major crop plants in the world today are wheat, rice, soybeans, and _____.

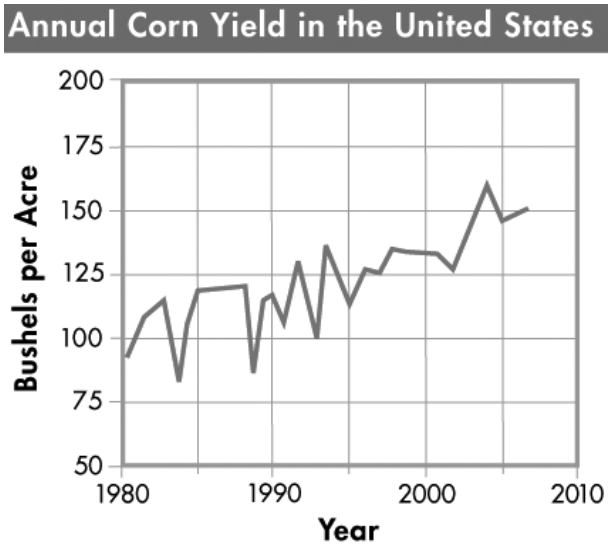

Figure 24–5

90. Figure 24–5 shows that between 1980 and 2007, the annual yield of corn in the United States fluctuated up and down. The overall trend, however, is that corn yield has _____.

Short Answer

91. What are the basic needs of plants?

92. Describe the materials that plants take in and release in order to survive.

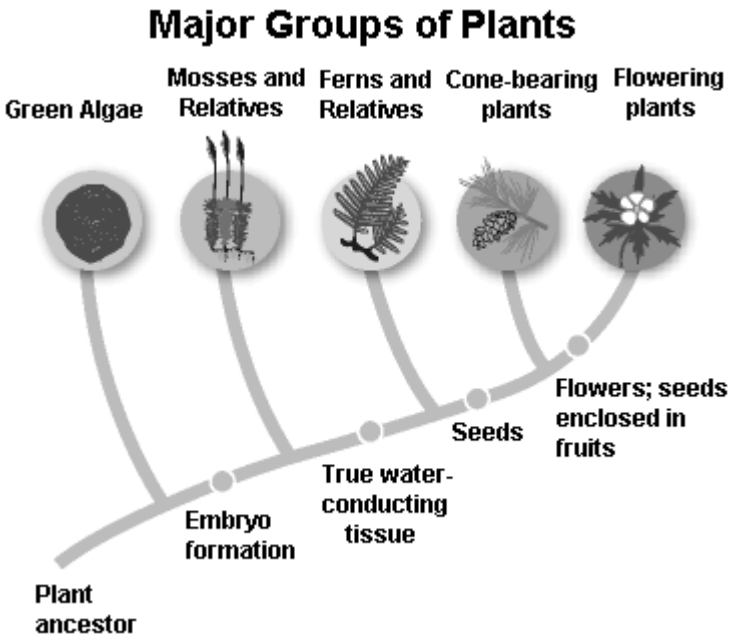

Figure 22–1

93. Based on Figure 22–1, identify which group of plants is most closely related to the ancestor of all plants and which group of plants evolved most recently.

94. Why is the sporophyte phase of all plants diploid?

95. Describe the alternation of generations in plants.

96. How can green algae survive without the specialized tissues found in other plants?

97. How are the rhizoids of mosses similar to roots? How are they different?

98. Where in a plant are tracheids found? Describe their role.

99. Compare xylem and phloem.

100. What is a pollen grain?

101. Describe pollination in gymnosperms.

102. Define *fruit*.

103. What could cause an angiosperm seedling to grow a long distance from the location of its parent plant?

104. Contrast the number of seed leaves in a monocot and dicot.

105. Lilies have flower parts in multiples of three and vascular bundles scattered throughout their stems. Corn plants have fibrous roots and leaves with parallel veins. Roses have tap roots and two cotyledons. Would you categorize lilies with corn plants or roses? Explain your answer.

106. How is the function of a tree trunk related to photosynthesis?

107. Contrast the flow of materials in xylem and phloem.

108. Why are protective structures such as seed coats made up of sclerenchyma?

109. In which tissue of a plant would you expect to find the greatest number of new cells?

110. What three kinds of tissues do meristems develop into?

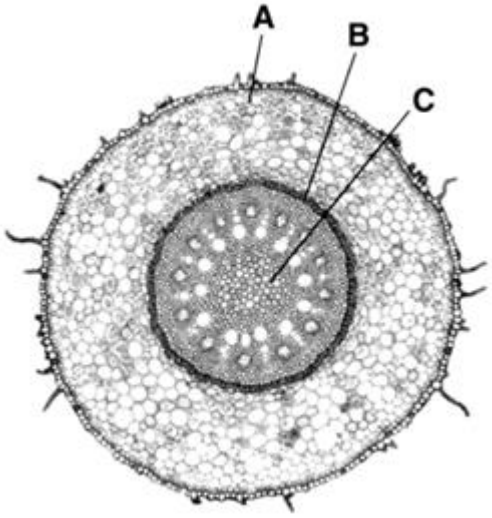

Figure 23–5

111. In Figure 23–5, what is structure C? Identify the tissues that make up this structure.

112. What do roots absorb from the soil?

113. In what function do both roots and stems play a part?

114. A scientist discovers a new plant. She notes that the plant forms wood as it becomes taller. Did the scientist discover a monocot or a dicot? Explain.

115. In what part of a leaf would you expect to find the greatest number of chloroplasts? Why?

116. During a very hot, sunny day, are stomata likely to be open or closed? Explain.

117. By what three processes does water rise from the roots to the top of a tree?

118. Root pressure causes guttation, which is the exuding of water droplets seen in the morning on blades of grass and on the leaf edges of some monocots. Why does guttation not occur in the leaves of trees?

119. According to the pressure-flow hypothesis, how does water from xylem cause sugars to flow through phloem?

120. In the pressure-flow hypothesis, what does the term *sink cell* refer to?

121. Name the four kinds of specialized leaves in a flower.

122. How is angiosperm fertilization different from fertilization in other plants? What two cells does fertilization in angiosperms produce?

123. Name three ways in which new plants are produced by vegetative reproduction.

124. If you were planning to graft two plants, what aspect of their growing conditions should you consider, and why?

125. What happens as angiosperm seeds mature?

126. How can you tell by looking at a fruit how the seeds it contains are likely dispersed?

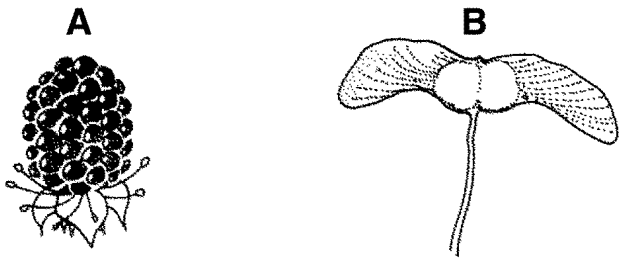

Figure 24–2

127. Of the fruits shown in Figure 24–2, which has seeds that are more likely spread by wind? How can you tell?

128. Name two environmental factors that can end a seed's dormancy.

129. What role does water play in the germination of a seed?

130. Sofia studied two genetically identical potted plants. One plant was tall and skinny and the other plant was short and bushy. Based on your understanding of plant hormones, what likely happened?

131. What is a plant hormone?

132. List three environmental stimuli to which plants respond.

133. What three major changes do deciduous plants undergo to get ready for winter?

134. Briefly describe the development of modern corn from a wild grass.

135. Aside from food, how might humans use walnut trees?

Other

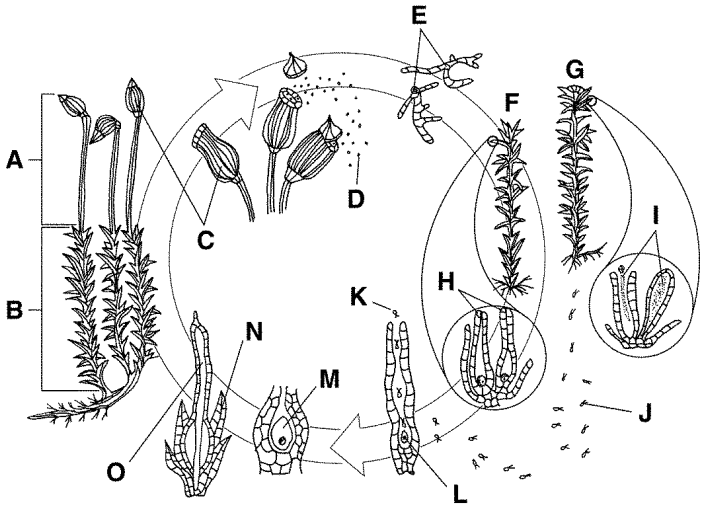

Figure 22–6

136. **Infer** Figure 22–6 illustrates the life cycle of a bryophyte. Which labeled structures are haploid?

137. **Compare and Contrast** How do structures A and B in Figure 22–6 differ? List at least two differences.

138. **Infer** In Figure 22–6, which labeled structure is formed by fertilization? What is the name of this structure?

139. **Infer** In Figure 22–6, what labeled structures are formed by meiosis? Name the structures.

140. **Classify** In Figure 22–6, what are structures H and I, and what are their functions?

	Monocots	**Dicots**
Leaves	Parallel veins	Branching veins
Flowers	Parts in multiples of three	Parts in multiples of four or five
Vascular Bundles in Stems	Scattered throughout stem	Arranged in a ring
Roots	Fibrous	Taproot
Seed Leaves	One seed leaf	Two seed leaves

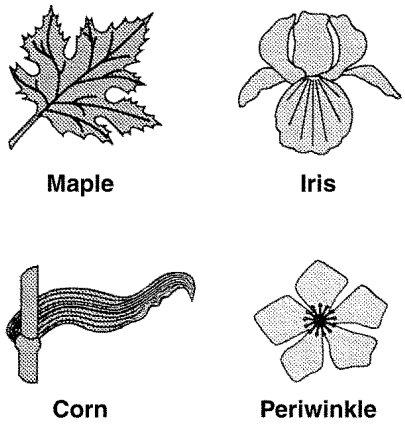

Figure 22–7

141. **Interpret Tables** Corn is a monocot. According to the table in Figure 22–7, does a corn seed have one or two seed leaves?

142. **Classify** Is the maple leaf in Figure 22–7 a monocot or a dicot? How do you know?

143. **Interpret Tables** Based on Figure 22–7, how are the vascular bundles in the stem of the corn plant arranged?

144. **Compare and Contrast** Which flower in Figure 22–7 is a monocot? How do you know?

145. **Classify** Of the four plants shown in Figure 22–7, which two belong in the same clade? Explain your reasoning.

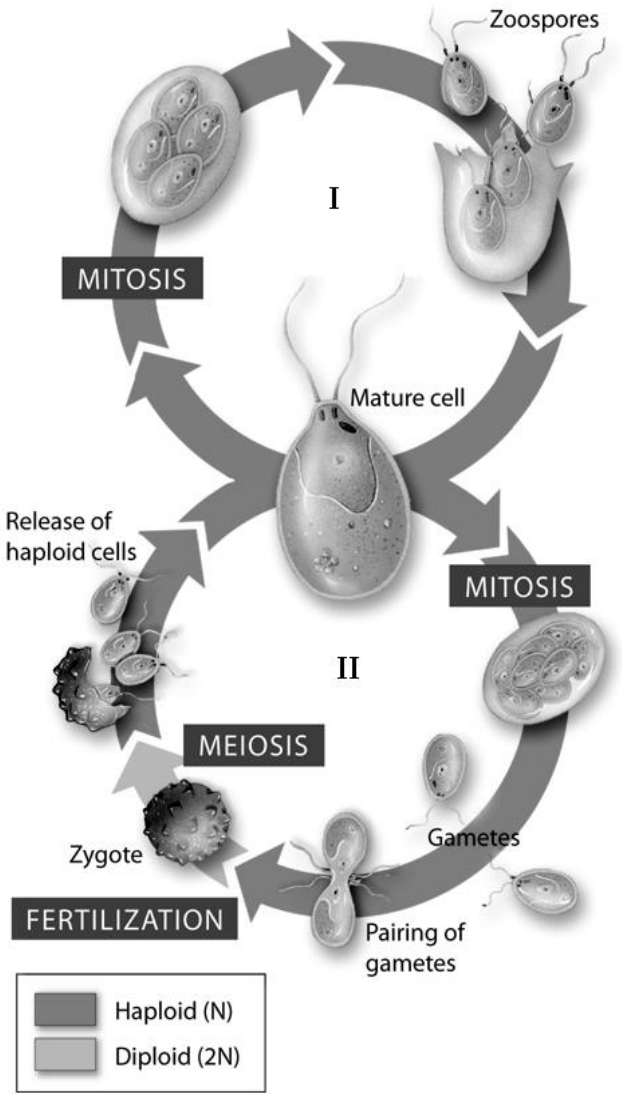

Figure 22–3

146. **Classify** Figure 22–3 shows reproduction for a member of what group of plants?

147. **Infer** Which part of the cycle shown in Figure 22–3 takes place when conditions are unfavorable?

148. **Infer** Based on Figure 22–3, does this organism undergo alternation of generations? Explain your reasoning.

149. **Infer** Identify which part of the cycle shown in Figure 22–3 is asexual reproduction, and identify which part of the cycle is sexual reproduction.

150. **Infer** What occurs as a result of the meiosis shown in Figure 22–3?

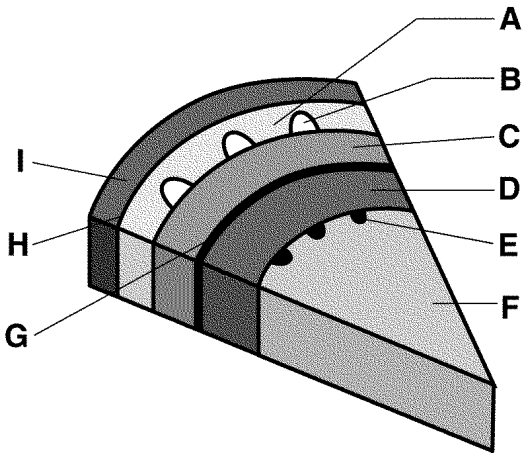

Figure 23–6

151. **Use Models** In Figure 23–6, which letters indicate structures that allow for the secondary growth of the stem? Identify the structures.

152. **Classify** Which labels in Figure 23–6 indicate ground tissue? Identify the cell types that might be found in ground tissue.

153. **Predict** In Figure 23–6, how does growth in the tissues labeled H and G affect the stem?

154. **Compare and Contrast** Which label in Figure 23–6 indicates cells that are secondary growth tissues, B or C? Identify the tissues.

155. **Use Models** Which structures in Figure 23–6 were formed by primary growth? What are they called?

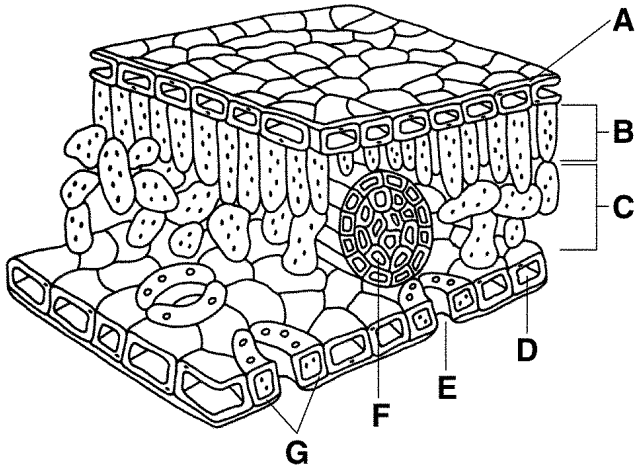

Figure 23–3

156. **Use Models** Which four structures in Figure 23–3 protect the leaf from drying out? Identify the structures.

157. **Interpret Visuals** In Figure 23–3, which letter represents a structure whose tissues lack chlorophyll? What is the structure called?

158. **Interpret Visuals** Are the stomata in the leaf in Figure 23–3 open or closed? Identify the letter of the stoma.

159. **Draw Conclusions** What is the importance of the spaces between the cells labeled C in Figure 23–3?

160. **Interpret Visuals** In Figure 23–3, what is structure F? What two types of tissues make up this structure?

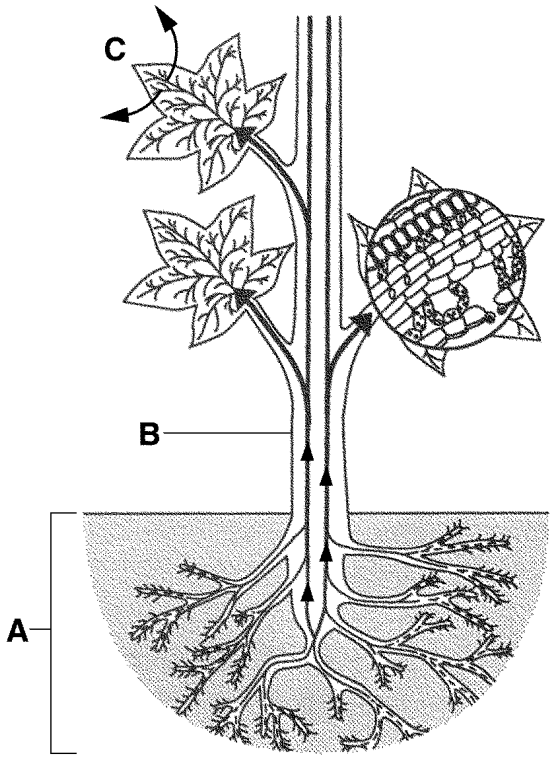

Figure 23–7

161. **Interpret Visuals** What do the arrows in Figure 23–7 represent?

162. **Infer** What process is helping to move water upward through part A of Figure 23–7?

163. **Infer** In part C of Figure 23–7, what process is helping to bring water to the top of the plant?

164. **Infer** In Figure 23–7, what process causes water to move upward in part B of the plant?

165. **Infer** What kind of vascular tissue is involved in the processes shown in Figure 23–7?

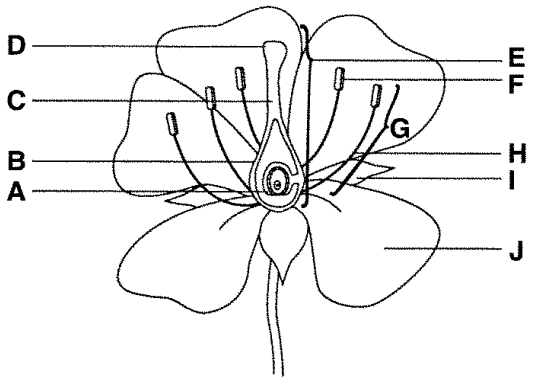

Figure 24–4

166. **Infer** Which label indicates the structure in Figure 24–4 that is most likely to be brightly colored? What is the structure?

167. **Interpret Visuals** Which labels Figure 24–4 point to male parts of the flower? Which labels point to female parts?

168. **Interpret Visuals** Which label points to the part of the flower in Figure 24–4 that produces pollen grains? What is this structure?

169. **Interpret Visuals** Which structure in Figure 24–4 receives pollen during pollination? What is the structure?

170. **Interpret Visuals** In Figure 24–4, what is the structure labeled C called?

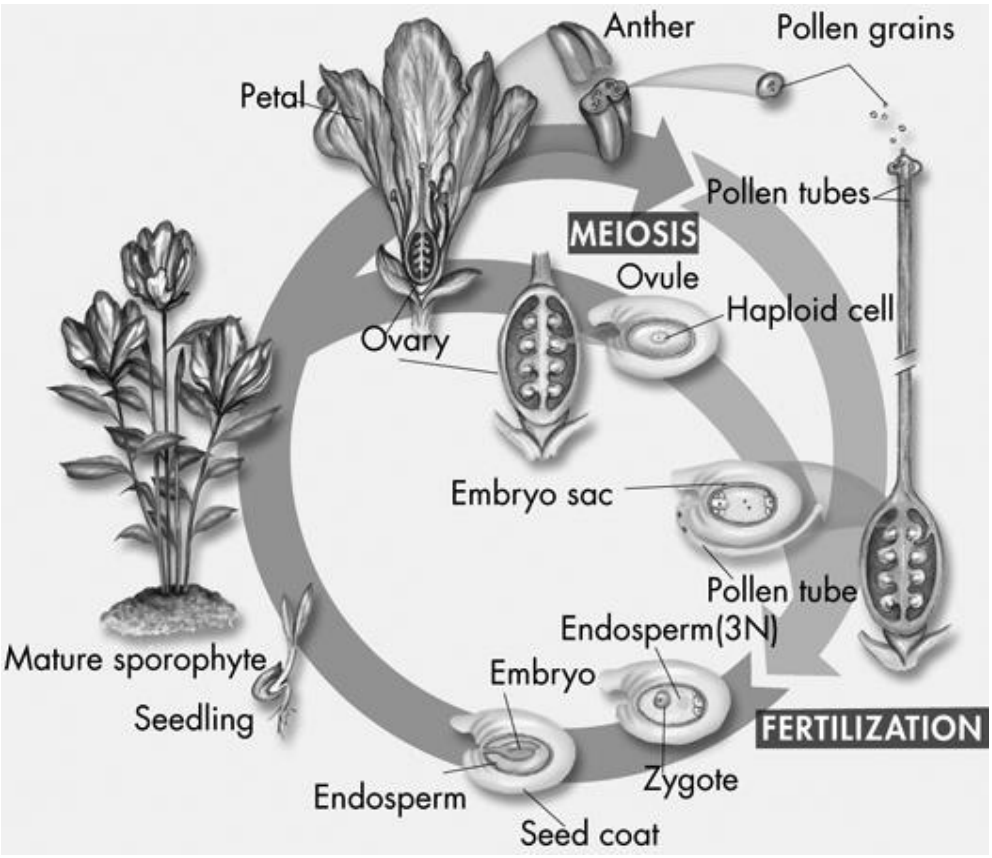

Figure 24–6

171. **Interpret Visuals** Which structure shown in Figure 24–6 allows sperm cells to enter the ovary?

172. **Apply Concepts** How many nuclei are in the embryo sac shown in Figure 24–6? How did these nuclei form?

173. **Apply Concepts** What evidence does Figure 24–6 show that the endosperm is unique among structures that form during plant reproduction ?

174. **Interpret Visuals** According to Figure 24–6, what happens to the endosperm as seed development progresses?

175. **Predict** What is the most likely way that the pollen of the flower shown in Figure 24–6 is dispersed? Explain your answer.

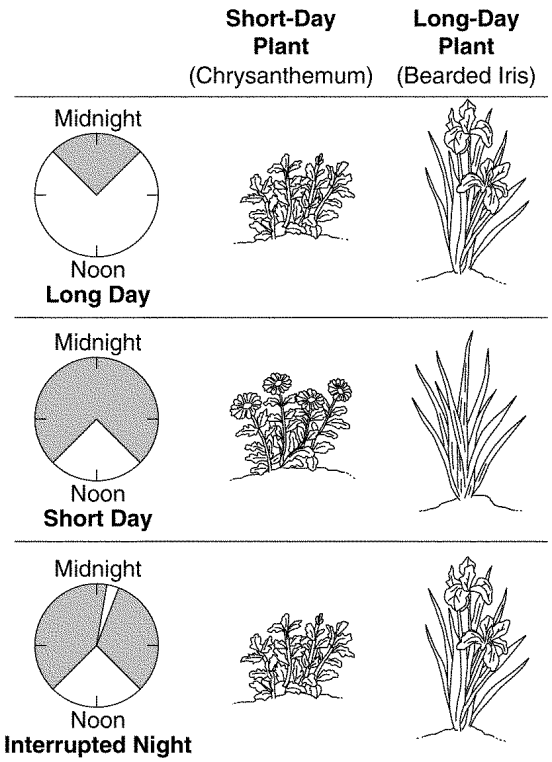

Figure 24–7

176. **Predict** Which of the plants in Figure 24–7 would you expect to have the highest level of cytokinin in the fall? Explain your answer.

177. **Apply Concepts** Describe the effect that phytochrome has on the bearded iris in Figure 24–7.

178. **Interpret Visuals** According to Figure 24–7, what will happen to each plant if it receives more than 12 hours of darkness each day? Why?

179. **Infer** Why doesn't the chrysanthemum in Figure 24–7 bloom when exposed to light in the middle of the night?

180. A plant-nursery owner wanted to sell bearded iris plants that bloom in December. Based on Figure 24–7, what should he or she do in order to produce winter-blooming bearded iris?

Essay

181. In an experiment, a scientist puts a plant in a closed system and controls the amount of air the plant gets. The plant gets plenty of light, water, and nutrients. If the scientist does not allow additional air into the system, how do you expect the air to change over time? How will the plant likely be affected?

182. Compare multicellular green algae with land plants. What do similarities between these organisms suggest?

183. What is the evolutionary relationship between the angiosperms and gymnosperms living today? Did the angiosperms evolve from the gymnosperms?

184. How might Earth be different today if the continents had not become much drier about 400 million years ago?

185. What does the term *alternation of generations* refer to? Describe a unique characteristic of alternation of generations in green algae, bryophytes, seedless vascular plants, and seed plants compared to the other groups.

186. Describe how a sporophyte is formed during the life cycle of a moss plant.

187. Explain the importance of vascular tissue in plants.

188. What structure in the fern life cycle is analogous to the embryo in a seed? How are the two structures similar? How are they different?

189. Compare and contrast angiosperms and gymnosperms.

190. How do animals aid in the reproduction of angiosperms?

191. In what ways do the leaves of a plant depend on the plant's roots and stem?

192. How do the functions of the three kinds of cells that form ground tissue differ?

193. Explain the role of active transport in the movement of water and dissolved nutrients from the soil to the root of a plant.

194. Describe the three main functions of stems.

195. A nail that has been hammered into the trunk of a tree is found at the same height year after year, even as the tree grows taller. Explain why.

196. Contrast primary growth and secondary growth.

197. Explain how the structure of the mesophyll of a plant is adapted to carry out photosynthesis.

198. Explain why the stomata of a plant open after the plant has been watered.

199. Under what conditions of rainfall, temperature, and light would a plant's stomata be closed? Explain your answer.

200. According to the pressure-flow hypothesis, under what conditions might roots contain the source cells and leaves contain the sink cells for sugars?

201. What advantage does vegetative reproduction offer someone who needs to grow large numbers of a specific plant variety for commercial sales?

202. Describe the formation of a fruit in an angiosperm.

203. How does having a large, sweet fruit benefit a plant?

204. Explain how a forest fire can affect the germination of certain pine seeds and the recovery of the forest from a fire.

205. The seeds of some plants can remain dormant for many years, germinating only when conditions are favorable. Why might a long period of dormancy be an advantage to a plant that lives in a harsh environment?

206. Explain why sealing fruit in a bag might cause the fruit to ripen quickly.

207. What happens to a plant when a gardener snips off the highest growing tip of a plant? What phenomenon has the gardener interrupted?

208. Briefly describe how plants respond to light and gravity.

209. Describe some of the changes that take place during winter dormancy, and explain how dormancy helps plants survive winter.

210. Describe ways in which humans have changed plants and used technology to improve crop yields.

Plants Practice Test
Answer Section

MODIFIED TRUE/FALSE

1. ANS: T PTS: 1 DIF: L2
   REF: p. 635 OBJ: 22.1.1 Describe what plants need to survive.
   STA: UT.BIO.2.2.b | UT.BIO.5.3.b TOP: Foundation Edition
   BLM: comprehension
2. ANS: T PTS: 1 DIF: L1
   REF: p. 636 OBJ: 22.1.2 Describe how the first plants evolved.
   STA: UT.BIO.5.2.a TOP: Foundation Edition
   BLM: knowledge
3. ANS: F, sporophyte

   PTS: 1 DIF: L3 REF: p. 638
   OBJ: 22.1.3 Explain the process of alternation of generations. STA: UT.BIO.4.1.a
   BLM: comprehension
4. ANS: F, green algae

   PTS: 1 DIF: L1 REF: p. 639
   OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
   TOP: Foundation Edition BLM: knowledge
5. ANS: F, colonies

   PTS: 1 DIF: L2 REF: p. 640
   OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
   TOP: Foundation Edition BLM: comprehension
6. ANS: T PTS: 1 DIF: L1
   REF: p. 641 OBJ: 22.2.2 Describe the adaptations of bryophytes.
   STA: UT.BIO.5.3.b TOP: Foundation Edition
   BLM: knowledge
7. ANS: F, Phloem

   PTS: 1 DIF: L1 REF: p. 643
   OBJ: 22.2.3 Explain the importance of vascular tissue. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
   TOP: Foundation Edition BLM: knowledge
8. ANS: F, seed

   PTS: 1 DIF: L2 REF: p. 646
   OBJ: 22.3.1 Describe the reproductive adaptations of seed plants.
   STA: UT.BIO.4.1.a | UT.BIO.5.2.a | UT.BIO.5.3.b TOP: Foundation Edition
   BLM: comprehension
9. ANS: F, angiosperms

   PTS: 1 DIF: L1 REF: p. 646
   OBJ: 22.3.1 Describe the reproductive adaptations of seed plants.
   STA: UT.BIO.4.1.a | UT.BIO.5.2.a | UT.BIO.5.3.b TOP: Foundation Edition

BLM: knowledge

10. ANS: T PTS: 1 DIF: L1
REF: p. 648 | p. 646
OBJ: 22.3.2 Identify the reproductive structures of gymnosperms.
STA: UT.BIO.4.1.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: knowledge

11. ANS: F, Seed cones

PTS: 1 DIF: L2 REF: p. 648
OBJ: 22.3.2 Identify the reproductive structures of gymnosperms.
STA: UT.BIO.4.1.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: comprehension

12. ANS: F, ovary

PTS: 1 DIF: L1 REF: p. 651
OBJ: 22.4.1 Identify the reproductive structures of angiosperms.
STA: UT.BIO.5.3.b TOP: Foundation Edition
BLM: knowledge

13. ANS: T PTS: 1 DIF: L2
REF: p. 651 OBJ: 22.4.1 Identify the reproductive structures of angiosperms.
STA: UT.BIO.5.3.b TOP: Foundation Edition
BLM: comprehension

14. ANS: F, taproots

PTS: 1 DIF: L2 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: comprehension

15. ANS: F, second

PTS: 1 DIF: L3 REF: p. 654
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b BLM: comprehension

16. ANS: T PTS: 1 DIF: L1
REF: p. 664 OBJ: 23.1.1 Identify the principal organs of seed plants.
STA: UT.BIO.3.1.b TOP: Foundation Edition
BLM: knowledge

17. ANS: F, sieve tube

PTS: 1 DIF: L1 REF: p. 666
OBJ: 23.1.2 Explain the primary functions of the main tissue systems of seed plants.
STA: UT.BIO.3.1.a | UT.BIO.3.2.d TOP: Foundation Edition
BLM: knowledge

18. ANS: T PTS: 1 DIF: L1
REF: p. 667 OBJ: 23.1.3 Contrast meristems with other plant tissues.
STA: UT.BIO.3.2.d TOP: Foundation Edition
BLM: comprehension

19. ANS: F, dermal

PTS: 1 DIF: L1 REF: p. 670

OBJ: 23.2.1 Describe the main tissues in a mature root.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c | UT.BIO.3.2.d TOP: Foundation Edition
BLM: knowledge

20. ANS: F, osmosis

PTS: 1 DIF: L2 REF: p. 672
OBJ: 23.2.2 Describe the different functions of roots.
STA: UT.BIO.2.3.c | UT.BIO.3.1.b | UT.BIO.3.1.c BLM: comprehension

21. ANS: F
Casparian strip
endodermis

PTS: 1 DIF: L2 REF: p. 672
OBJ: 23.2.2 Describe the different functions of roots.
STA: UT.BIO.2.3.c | UT.BIO.3.1.b | UT.BIO.3.1.c TOP: Foundation Edition
BLM: knowledge

22. ANS: F, apical meristems

PTS: 1 DIF: L2 REF: p. 675
OBJ: 23.3.1 Describe the main functions of stems.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c | UT.BIO.3.2.d TOP: Foundation Edition
BLM: comprehension

23. ANS: F, cork cambium

PTS: 1 DIF: L2 REF: p. 676 | p. 677
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e BLM: knowledge

24. ANS: T PTS: 1 DIF: L2
REF: p. 678 OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e BLM: comprehension

25. ANS: F, blade

PTS: 1 DIF: L2 REF: p. 680
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c BLM: knowledge

26. ANS: F, evaporation

PTS: 1 DIF: L2 REF: p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c TOP: Foundation Edition
BLM: comprehension

27. ANS: F, close

PTS: 1 DIF: L2 REF: p. 682
OBJ: 23.4.2 Explain how gas exchange in leaves relates to homeostasis.
STA: UT.BIO.2.3.c TOP: Foundation Edition
BLM: comprehension

28. ANS: T PTS: 1 DIF: L3
REF: p. 682 OBJ: 23.4.2 Explain how gas exchange in leaves relates to homeostasis.
STA: UT.BIO.2.3.c BLM: comprehension

29. ANS: T PTS: 1 DIF: L1
REF: p. 685 OBJ: 23.5.1 Explain the process of water movement in a plant.
STA: UT.BIO.2.3.d TOP: Foundation Edition
BLM: comprehension
30. ANS: F, branches

PTS: 1 DIF: L2 REF: p. 687
OBJ: 23.5.2 Describe how the products of photosynthesis are transported throughout a plant.
STA: UT.BIO.2.2.b BLM: comprehension
31. ANS: T PTS: 1 DIF: L2
REF: p. 696 OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: application
32. ANS: F, petal

PTS: 1 DIF: L1 REF: p. 696
OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: knowledge
33. ANS: T PTS: 1 DIF: L2
REF: p. 700 OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a TOP: Foundation Edition
BLM: comprehension
34. ANS: T PTS: 1 DIF: L2
REF: p. 703 OBJ: 24.1.3 Describe vegetative reproduction.
STA: UT.BIO.4.1.b TOP: Foundation Edition
BLM: comprehension
35. ANS: T PTS: 1 DIF: L1
REF: p. 704 OBJ: 24.2.1 Describe the development of seeds and fruits.
STA: UT.BIO.5.1.a TOP: Foundation Edition
BLM: knowledge
36. ANS: F, wind

PTS: 1 DIF: L2 REF: p. 705
OBJ: 24.2.2 Explain how seeds are dispersed. STA: UT.BIO.5.1.a
TOP: Foundation Edition BLM: comprehension
37. ANS: T PTS: 1 DIF: L1
REF: p. 706 OBJ: 24.2.3 List the factors that influence the dormancy and germination of seeds.
STA: UT.BIO.5.1.a TOP: Foundation Edition
BLM: comprehension
38. ANS: F, Cytokinins

PTS: 1 DIF: L2 REF: p. 710 | p. 711
OBJ: 24.3.1 Describe the effects of hormones on plant growth and development.
STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: comprehension
39. ANS: F, auxin

PTS: 1 DIF: L2 REF: p. 709
OBJ: 24.3.1 Describe the effects of hormones on plant growth and development.

STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: comprehension

40. ANS: F, gravitropism

PTS: 1 DIF: L3 REF: p. 712
OBJ: 24.3.2 Identify three tropisms exhibited in plants. STA: UT.BIO.2.3.e
BLM: synthesis

41. ANS: F, thigmotropism

PTS: 1 DIF: L2 REF: p. 712
OBJ: 24.3.2 Identify three tropisms exhibited in plants. STA: UT.BIO.2.3.e
TOP: Foundation Edition BLM: comprehension

42. ANS: F, carotenoid

PTS: 1 DIF: L2 REF: p. 714
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
TOP: Foundation Edition BLM: knowledge

43. ANS: F, Short-day

PTS: 1 DIF: L1 REF: p. 713
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
TOP: Foundation Edition BLM: comprehension

44. ANS: F, endosperm

PTS: 1 DIF: L3 REF: p. 716
OBJ: 24.4.1 Identify the major food-supply crops for humans. STA: UT.BIO.5.1.d
BLM: synthesis

45. ANS: T PTS: 1 DIF: L1
REF: p. 718 OBJ: 24.4.2 Describe how humans benefit from plants.
TOP: Foundation Edition BLM: comprehension

COMPLETION

46. ANS:
gases
carbon dioxide and oxygen

PTS: 1 DIF: L2 REF: p. 635
OBJ: 22.1.1 Describe what plants need to survive. STA: UT.BIO.2.2.b | UT.BIO.5.3.b
TOP: Foundation Edition BLM: knowledge

47. ANS: flowering plants

PTS: 1 DIF: L2 REF: p. 636
OBJ: 22.1.2 Describe how the first plants evolved. STA: UT.BIO.5.2.a
TOP: Foundation Edition BLM: application

48. ANS: vascular tissue

PTS: 1 DIF: L2 REF: p. 636
OBJ: 22.1.2 Describe how the first plants evolved. STA: UT.BIO.5.2.a

TOP: Foundation Edition BLM: comprehension

49. ANS: alternation of generations

PTS: 1 DIF: L1 REF: p. 637
OBJ: 22.1.3 Explain the process of alternation of generations. STA: UT.BIO.4.1.a
TOP: Foundation Edition BLM: knowledge

50. ANS: haploid, diploid

PTS: 1 DIF: L2 REF: p. 637
OBJ: 22.1.3 Explain the process of alternation of generations. STA: UT.BIO.4.1.a
TOP: Foundation Edition BLM: knowledge

51. ANS: Green algae

PTS: 1 DIF: L3 REF: p. 639 | p. 640
OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: application

52. ANS: gametophyte

PTS: 1 DIF: L3 REF: p. 641 | p. 642
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b
BLM: application

53. ANS:
osmosis
diffusion

PTS: 1 DIF: L2 REF: p. 641
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b
TOP: Foundation Edition BLM: comprehension

54. ANS: tracheophytes

PTS: 1 DIF: L2 REF: p. 643
OBJ: 22.2.3 Explain the importance of vascular tissue. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: knowledge

55. ANS: seed coat

PTS: 1 DIF: L2 REF: p. 647
OBJ: 22.3.1 Describe the reproductive adaptations of seed plants.
STA: UT.BIO.4.1.a | UT.BIO.5.2.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: comprehension

56. ANS: seed cone

PTS: 1 DIF: L3 REF: p. 649
OBJ: 22.3.2 Identify the reproductive structures of gymnosperms.
STA: UT.BIO.4.1.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: comprehension

57. ANS: fruit

PTS: 1 DIF: L3 REF: p. 651
OBJ: 22.4.1 Identify the reproductive structures of angiosperms.
STA: UT.BIO.5.3.b BLM: comprehension

58. ANS: vein

PTS: 1 DIF: L3 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b BLM: application

59. ANS: annual

PTS: 1 DIF: L2 REF: p. 654
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b BLM: application

60. ANS: herbaceous plant

PTS: 1 DIF: L1 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: comprehension

61. ANS: stems

PTS: 1 DIF: L1 REF: p. 664
OBJ: 23.1.1 Identify the principal organs of seed plants. STA: UT.BIO.3.1.b
TOP: Foundation Edition BLM: knowledge

62. ANS: sieve tube elements

PTS: 1 DIF: L2 REF: p. 666
OBJ: 23.1.2 Explain the primary functions of the main tissue systems of seed plants.
STA: UT.BIO.3.1.a | UT.BIO.3.2.d TOP: Foundation Edition
BLM: knowledge

63. ANS: companion cells

PTS: 1 DIF: L2 REF: p. 666
OBJ: 23.1.2 Explain the primary functions of the main tissue systems of seed plants.
STA: UT.BIO.3.1.a | UT.BIO.3.2.d BLM: knowledge

64. ANS: Meristems

PTS: 1 DIF: L1 REF: p. 667
OBJ: 23.1.3 Contrast meristems with other plant tissues. STA: UT.BIO.3.2.d
TOP: Foundation Edition BLM: knowledge

65. ANS: root hairs

PTS: 1 DIF: L2 REF: p. 670
OBJ: 23.2.1 Describe the main tissues in a mature root.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c | UT.BIO.3.2.d TOP: Foundation Edition
BLM: knowledge

66. ANS: endodermis, Casparian strip

PTS: 1 DIF: L3 REF: p. 672
OBJ: 23.2.2 Describe the different functions of roots.
STA: UT.BIO.2.3.c | UT.BIO.3.1.b | UT.BIO.3.1.c TOP: Foundation Edition
BLM: knowledge

67. ANS: increases

PTS: 1 DIF: L3 REF: p. 672
OBJ: 23.2.2 Describe the different functions of roots.
STA: UT.BIO.2.3.c | UT.BIO.3.1.b | UT.BIO.3.1.c BLM: comprehension

68. ANS: buds

PTS: 1 DIF: L1 REF: p. 675
OBJ: 23.3.1 Describe the main functions of stems.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c | UT.BIO.3.2.d TOP: Foundation Edition
BLM: knowledge

69. ANS: primary growth

PTS: 1 DIF: L1 REF: p. 676
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: comprehension

70. ANS: 12

PTS: 1 DIF: L1 REF: p. 678
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: comprehension

71. ANS: vascular cambium, cork cambium

PTS: 1 DIF: L2 REF: p. 676 | p. 677
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e BLM: comprehension

72. ANS: spongy mesophyll

PTS: 1 DIF: L2 REF: p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c BLM: comprehension

73. ANS: Guard cells

PTS: 1 DIF: L1 REF: p. 682 | p. 681
OBJ: 23.4.2 Explain how gas exchange in leaves relates to homeostasis.
STA: UT.BIO.2.3.c TOP: Foundation Edition
BLM: knowledge

74. ANS: cohesion, adhesion

PTS: 1 DIF: L2 REF: p. 686
OBJ: 23.5.1 Explain the process of water movement in a plant. STA: UT.BIO.2.3.d
TOP: Foundation Edition BLM: comprehension

75. ANS: pressure-flow hypothesis

PTS: 1 DIF: L1 REF: p. 687
OBJ: 23.5.2 Describe how the products of photosynthesis are transported throughout a plant.
STA: UT.BIO.2.2.b TOP: Foundation Edition
BLM: knowledge

76. ANS: anther

PTS: 1 DIF: L1 REF: p. 696 | p. 697
OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: knowledge

77. ANS: embryo sac

PTS: 1 DIF: L2 REF: p. 699
OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a BLM: knowledge

78. ANS: endosperm

PTS: 1 DIF: L2 REF: p. 700
OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a BLM: comprehension

79. ANS:
stolons
stems

PTS: 1 DIF: L2 REF: p. 702
OBJ: 24.1.3 Describe vegetative reproduction. STA: UT.BIO.4.1.b
TOP: Foundation Edition BLM: knowledge

80. ANS: fruit

PTS: 1 DIF: L2 REF: p. 704
OBJ: 24.2.1 Describe the development of seeds and fruits. STA: UT.BIO.5.1.a
TOP: Foundation Edition BLM: comprehension

81. ANS:
seed coats
coatings

PTS: 1 DIF: L2 REF: p. 705
OBJ: 24.2.2 Explain how seeds are dispersed. STA: UT.BIO.5.1.a
TOP: Foundation Edition BLM: knowledge

82. ANS: water

PTS: 1 DIF: L1 REF: p. 705
OBJ: 24.2.2 Explain how seeds are dispersed. STA: UT.BIO.5.1.a
TOP: Foundation Edition BLM: knowledge

83. ANS: competition

PTS: 1 DIF: L3 REF: p. 704 | p. 705
OBJ: 24.2.2 Explain how seeds are dispersed. STA: UT.BIO.5.1.a
BLM: comprehension

84. ANS: germination

PTS: 1 DIF: L2 REF: p. 706
OBJ: 24.2.3 List the factors that influence the dormancy and germination of seeds.
STA: UT.BIO.5.1.a BLM: comprehension

85. ANS: ethylene

PTS: 1 DIF: L1 REF: p. 711
OBJ: 24.3.1 Describe the effects of hormones on plant growth and development.
STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: knowledge

86. ANS: cytokinins, auxins

PTS: 1 DIF: L3 REF: p. 709 | p. 710 | p. 711
OBJ: 24.3.1 Describe the effects of hormones on plant growth and development.
STA: UT.BIO.2.3.e BLM: comprehension

87. ANS: gravitropism

PTS: 1 DIF: L2 REF: p. 712
OBJ: 24.3.2 Identify three tropisms exhibited in plants. STA: UT.BIO.2.3.e
BLM: synthesis

88. ANS: phytochrome

PTS: 1 DIF: L2 REF: p. 713
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
TOP: Foundation Edition BLM: comprehension

89. ANS: corn

PTS: 1 DIF: L1 REF: p. 715
OBJ: 24.4.1 Identify the major food-supply crops for humans. STA: UT.BIO.5.1.d
TOP: Foundation Edition BLM: knowledge

90. ANS:
increased
risen

PTS: 1 DIF: L2 REF: p. 717
OBJ: 24.4.1 Identify the major food-supply crops for humans. STA: UT.BIO.5.1.d
TOP: Foundation Edition BLM: application

SHORT ANSWER

91. ANS:
Plants need sunlight, they need to exchange gases, and they need water and minerals.

PTS: 1 DIF: L1 REF: p. 635
OBJ: 22.1.1 Describe what plants need to survive. STA: UT.BIO.2.2.b | UT.BIO.5.3.b
TOP: Foundation Edition BLM: knowledge

92. ANS:
Plants take in energy from sunlight, carbon dioxide from the atmosphere, and water and nutrients from soil. They release oxygen into the atmosphere.

PTS: 1 DIF: L2 REF: p. 635
OBJ: 22.1.1 Describe what plants need to survive. STA: UT.BIO.2.2.b | UT.BIO.5.3.b
TOP: Foundation Edition BLM: comprehension

93. ANS:

Green algae are most closely related to the ancestor of all plants. Flowering plants, or angiosperms, were the last group of plants to evolve.

PTS: 1 DIF: L2 REF: p. 636
OBJ: 22.1.2 Describe how the first plants evolved. STA: UT.BIO.5.2.a
TOP: Foundation Edition BLM: analysis

94. ANS:
The sporophyte results from the fusion of an egg and sperm, which are both haploid.

PTS: 1 DIF: L3 REF: p. 637
OBJ: 22.1.3 Explain the process of alternation of generations. STA: UT.BIO.4.1.a
BLM: comprehension

95. ANS:
Plants shift between a haploid sporophyte phase and a diploid gametophyte phase.

PTS: 1 DIF: L1 REF: p. 637
OBJ: 22.1.3 Explain the process of alternation of generations. STA: UT.BIO.4.1.a
TOP: Foundation Edition BLM: comprehension

96. ANS:
Green algae live in areas where they are in direct contact with water. They can absorb moisture directly from their surroundings and do not need specialized cells to do so.

PTS: 1 DIF: L2 REF: p. 639
OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: comprehension

97. ANS:
Like roots, rhizoids anchor plants in the ground and absorb water and minerals from the soil. Unlike roots, rhizoids do not have vascular tissue.

PTS: 1 DIF: L2 REF: p. 641
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b
BLM: analysis

98. ANS:
Tracheids are found in vascular tissue in the xylem. Openings between tracheids allow water to flow through a plant more efficiently than by diffusion alone.

PTS: 1 DIF: L3 REF: p. 643
OBJ: 22.2.3 Explain the importance of vascular tissue. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: synthesis

99. ANS:
Xylem transports water while phloem transports solutions of nutrients and carbohydrates.

PTS: 1 DIF: L2 REF: p. 643
OBJ: 22.2.3 Explain the importance of vascular tissue. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
TOP: Foundation Edition BLM: analysis

100. ANS:
A pollen grain is a tiny structure produced by seed plants that contains the male gametophyte.

PTS: 1 DIF: L1 REF: p. 647
OBJ: 22.3.1 Describe the reproductive adaptations of seed plants.

STA: UT.BIO.4.1.a | UT.BIO.5.2.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: comprehension

101. ANS:
Pollen grains are moved by wind from male cones to female cones.

PTS: 1 DIF: L2 REF: p. 648
OBJ: 22.3.2 Identify the reproductive structures of gymnosperms.
STA: UT.BIO.4.1.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: comprehension

102. ANS:
A fruit is an angiosperm structure that forms from an ovary and contains one or more seeds.

PTS: 1 DIF: L1 REF: p. 651
OBJ: 22.4.1 Identify the reproductive structures of angiosperms.
STA: UT.BIO.5.3.b TOP: Foundation Edition
BLM: knowledge

103. ANS:
The fruit that contained the seed from which the seedling grew could have been carried a long distance by the wind or eaten and carried by an animal before its seeds were dispersed.

PTS: 1 DIF: L3 REF: p. 651
OBJ: 22.4.1 Identify the reproductive structures of angiosperms.
STA: UT.BIO.5.3.b BLM: comprehension

104. ANS:
A monocot has one seed leaf; a dicot has two seed leaves.

PTS: 1 DIF: L1 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: knowledge

105. ANS:
Lilies and corn should be categorized together because their features described are of monocots. The features described of roses are of dicots.

PTS: 1 DIF: L3 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b BLM: evaluation

106. ANS:
The xylem in a tree trunk carries water from the roots to the leaves. The water is used for photosynthesis. The tree trunk carries the carbohydrates produced during photosynthesis from the leaves to other parts of the plant.

PTS: 1 DIF: L3 REF: p. 664
OBJ: 23.1.1 Identify the principal organs of seed plants. STA: UT.BIO.3.1.b
BLM: analysis

107. ANS:
Through the xylem, water moves only upward into the plant. Through the phloem, carbohydrates and other materials can move both upward and downward.

PTS: 1 DIF: L2 REF: p. 666
OBJ: 23.1.2 Explain the primary functions of the main tissue systems of seed plants.

STA: UT.BIO.3.1.a | UT.BIO.3.2.d TOP: Foundation Edition
BLM: analysis

108. ANS:
Sclerenchyma is a type of ground tissue in which cells have extremely thick and rigid cell walls. This makes sclerenchyma the ideal material for a seed coat, which protects a developing embryo.

PTS: 1 DIF: L3 REF: p. 667
OBJ: 23.1.2 Explain the primary functions of the main tissue systems of seed plants.
STA: UT.BIO.3.1.a | UT.BIO.3.2.d BLM: synthesis

109. ANS:
The greatest number of new cells are found in the meristems.

PTS: 1 DIF: L2 REF: p. 667
OBJ: 23.1.3 Contrast meristems with other plant tissues. STA: UT.BIO.3.2.d
BLM: comprehension

110. ANS:
Meristems develop into dermal, vascular, and ground tissues.

PTS: 1 DIF: L1 REF: p. 668
OBJ: 23.1.3 Contrast meristems with other plant tissues. STA: UT.BIO.3.2.d
TOP: Foundation Edition BLM: knowledge

111. ANS:
Structure C is the vascular cylinder, which is made of xylem and phloem.

PTS: 1 DIF: L3 REF: p. 670
OBJ: 23.2.1 Describe the main tissues in a mature root.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c | UT.BIO.3.2.d BLM: application

112. ANS:
Roots absorb water and dissolved nutrients from the soil.

PTS: 1 DIF: L1 REF: p. 671
OBJ: 23.2.2 Describe the different functions of roots.
STA: UT.BIO.2.3.c | UT.BIO.3.1.b | UT.BIO.3.1.c TOP: Foundation Edition
BLM: knowledge

113. ANS:
Both roots and stems transport substances.

PTS: 1 DIF: L3 REF: p. 674 | p. 675 | p. 671
OBJ: 23.3.1 Describe the main functions of stems.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c | UT.BIO.3.2.d BLM: analysis

114. ANS:
The plant forms wood, which results from secondary growth. Monocots rarely go through secondary growth, so the scientist likely discovered a dicot.

PTS: 1 DIF: L3 REF: p. 676 | p. 677
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e BLM: synthesis

115. ANS:
The mesophyll would have the greatest number of chloroplasts. Photosynthesis occurs in this part of the leaf.

PTS: 1 DIF: L3 REF: p. 680 | p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c BLM: analysis

116. ANS:
On a hot sunny day, stomata will most likely be closed because the plant will need to conserve water.

PTS: 1 DIF: L2 REF: p. 683
OBJ: 23.4.2 Explain how gas exchange in leaves relates to homeostasis.
STA: UT.BIO.2.3.c TOP: Foundation Edition
BLM: analysis

117. ANS:
Water rises from the roots to the top of a tree by root pressure, capillary action, and transpirational pull.

PTS: 1 DIF: L2 REF: p. 685 | p. 686
OBJ: 23.5.1 Explain the process of water movement in a plant. STA: UT.BIO.2.3.d
TOP: Foundation Edition BLM: knowledge

118. ANS:
Guttation does not occur in the leaves of trees because root pressure alone cannot force water high enough to reach the leaves.

PTS: 1 DIF: L3 REF: p. 685 | p. 686
OBJ: 23.5.1 Explain the process of water movement in a plant. STA: UT.BIO.2.3.d
BLM: synthesis

119. ANS:
When sugars are pumped into phloem, water moves by osmosis from xylem into the phloem, increasing the pressure in the phloem. The increased pressure forces the sugars through the phloem.

PTS: 1 DIF: L2 REF: p. 687
OBJ: 23.5.2 Describe how the products of photosynthesis are transported throughout a plant.
STA: UT.BIO.2.2.b BLM: comprehension

120. ANS:
Sink cells are places in a plant where sugars are used or stored.

PTS: 1 DIF: L2 REF: p. 687
OBJ: 23.5.2 Describe how the products of photosynthesis are transported throughout a plant.
STA: UT.BIO.2.2.b BLM: knowledge

121. ANS:
sepals, petals, stamens, and carpels

PTS: 1 DIF: L1 REF: p. 696
OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: knowledge

122. ANS:
Angiosperms undergo double fertilization, which produces a diploid zygote and a triploid cell that eventually produces endosperm.

PTS: 1 DIF: L2 REF: p. 700
OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a TOP: Foundation Edition

BLM: comprehension

123. ANS:
New plants may grow from underground stems, from aboveground stolons, and from sections of stems that are dropped by plants.

PTS: 1 DIF: L2 REF: p. 702
OBJ: 24.1.3 Describe vegetative reproduction. STA: UT.BIO.4.1.b
TOP: Foundation Edition BLM: comprehension

124. ANS:
The plants should be dormant so wounds from the graft can heal before growth starts again.

PTS: 1 DIF: L2 REF: p. 703
OBJ: 24.1.3 Describe vegetative reproduction. STA: UT.BIO.4.1.b
BLM: comprehension

125. ANS:
The ovary walls thicken to form a fruit, which surrounds the seeds.

PTS: 1 DIF: L1 REF: p. 704
OBJ: 24.2.1 Describe the development of seeds and fruits. STA: UT.BIO.5.1.a
TOP: Foundation Edition BLM: application

126. ANS:
Seeds that are contained in dry, lightweight seeds likely are likely dispersed by wind or water, whereas seeds encased in a sweet, fleshy fruit likely are likely dispersed by animals.

PTS: 1 DIF: L3 REF: p. 705
OBJ: 24.2.2 Explain how seeds are dispersed. STA: UT.BIO.5.1.a
BLM: synthesis

127. ANS:
Because they are contained in lightweight fruits that can be carried in the air, the seeds of B are more likely spread by wind.

PTS: 1 DIF: L1 REF: p. 705
OBJ: 24.2.2 Explain how seeds are dispersed. STA: UT.BIO.5.1.a
TOP: Foundation Edition BLM: application

128. ANS:
temperature and moisture

PTS: 1 DIF: L1 REF: p. 706
OBJ: 24.2.3 List the factors that influence the dormancy and germination of seeds.
STA: UT.BIO.5.1.a TOP: Foundation Edition
BLM: comprehension

129. ANS:
Germinating seeds absorb water, which causes the endosperm to swell, cracking open the seed coat and allowing the young root and shoot to emerge.

PTS: 1 DIF: L2 REF: p. 706
OBJ: 24.2.3 List the factors that influence the dormancy and germination of seeds.
STA: UT.BIO.5.1.a BLM: comprehension

130. ANS:

Someone likely cut off the apical meristem of the short, bushy plant and interfered with apical dominance. Auxins are produced in the apical meristem. They prevent lateral bud growth. When the meristem is removed, the lateral buds rapidly grow, producing a shorter, bushier plant.

PTS: 1 DIF: L3 REF: p. 709 | p. 710
OBJ: 24.3.1 Describe the effects of hormones on plant growth and development.
STA: UT.BIO.2.3.e BLM: analysis

131. ANS:
A plant hormone is a chemical signal that affects a plant's growth, activity, and development and that coordinates its responses to the environment.

PTS: 1 DIF: L2 REF: p. 708
OBJ: 24.3.1 Describe the effects of hormones on plant growth and development.
STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: knowledge

132. ANS:
light, gravity, and touch

PTS: 1 DIF: L1 REF: p. 712
OBJ: 24.3.2 Identify three tropisms exhibited in plants. STA: UT.BIO.2.3.e
TOP: Foundation Edition BLM: comprehension

133. ANS:
Photosynthetic pathways are turned off, nutrients are transported from the leaves to the roots, and the leaves are sealed off from the rest of the plant.

PTS: 1 DIF: L1 REF: p. 714
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
TOP: Foundation Edition BLM: application

134. ANS:
Through selective breeding, humans developed modern corn from a wild grass called teosinte. Teosinte has tiny kernels. Over thousands of years, humans selected certain traits, producing the much larger kernels of modern corn.

PTS: 1 DIF: L2 REF: p. 716
OBJ: 24.4.1 Identify the major food-supply crops for humans. STA: UT.BIO.5.1.d
TOP: Foundation Edition BLM: knowledge

135. ANS:
Sample answer: Humans might use walnut trees for wood, which in turn could be used to build furniture or to build a home.

PTS: 1 DIF: L2 REF: p. 718
OBJ: 24.4.2 Describe how humans benefit from plants. BLM: synthesis

OTHER

136. ANS:
Structures B, D, E, F, G, H, I, J, K, L, and N are haploid.

PTS: 1 DIF: L2 REF: p. 642
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b

BLM: application

137. ANS:
Structure A is a sporophyte. It is diploid. It produces spores and is dependent on the gametophyte for water and nutrients. Structure B is a gametophyte. It is haploid. It carries out most of the plant's photosynthesis and has rhizoids. Both represent different stages in the life cycle of a moss.

PTS: 1 DIF: L3 REF: p. 642
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b
BLM: analysis

138. ANS:
Structure M is formed by fertilization; it is called a zygote.

PTS: 1 DIF: L2 REF: p. 642
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b
BLM: application

139. ANS:
Spores, which are labeled D, are formed by meiosis.

PTS: 1 DIF: L2 REF: p. 642
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b
BLM: application

140. ANS:
Structure H is an archegonium, which produces eggs. Structure I is an antheridium, which produces sperm.

PTS: 1 DIF: L2 REF: p. 642
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b
BLM: application

141. ANS:
A corn seed has one seed leaf.

PTS: 1 DIF: L1 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: application

142. ANS:
The maple leaf is a dicot because it has branching veins.

PTS: 1 DIF: L1 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: application

143. ANS:
The vascular bundles are scattered throughout the stem.

PTS: 1 DIF: L1 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: application

144. ANS:
The iris is a monocot because it has six floral parts, which is a multiple of three.

PTS: 1 DIF: L1 REF: p. 653
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: application

145. ANS:
Angiosperms were once classified as monocots or dicots, but evidence suggests that dicots should be classified in several clades. However, monocots are classified in one clade, so corn and the iris belong in the same clade because they are both monocots.

PTS: 1 DIF: L3 REF: p. 652
OBJ: 22.4.2 Identify some of the ways angiosperms can be categorized.
STA: UT.BIO.5.3.a | UT.BIO.5.3.b BLM: evaluation

146. ANS:
The reproduction of a type of green alga is shown.

PTS: 1 DIF: L2 REF: p. 640
OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: application

147. ANS:
Part II takes place when conditions are unfavorable.

PTS: 1 DIF: L2 REF: p. 640
OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: application

148. ANS:
Based on the figure, the organism undergoes alternation of generations, but it may stay in the haploid phase for a long period of time.

PTS: 1 DIF: L2 REF: p. 640
OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: analysis

149. ANS:
Part I shows asexual reproduction. Part II shows sexual reproduction.

PTS: 1 DIF: L2 REF: p. 640
OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: application

150. ANS:
The zygote undergoes meiosis to produce four haploid flagellated algal cells.

PTS: 1 DIF: L2 REF: p. 640
OBJ: 22.2.1 Identify the characteristics of green algae. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
BLM: comprehension

151. ANS:
Label G indicates the vascular cambium and label H indicates the cork cambium. Together, these two meristems allow for the secondary growth of the stem.

PTS: 1 DIF: L3 REF: p. 676 | p. 677
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.

STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: application

152. ANS:
Label A indicates cortex and label F indicates pith; both are parenchyma, a type of ground tissue. Ground tissue can be parenchyma, collenchyma, or sclerenchyma.

PTS: 1 DIF: L3 REF: p. 676 | p. 677 | p. 667 | p. 670
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e BLM: application

153. ANS:
Labels H and G indicate meristems. Growth in these two areas makes the stem wider.

PTS: 1 DIF: L2 REF: p. 676 | p. 678
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: analysis

154. ANS:
Label C points to secondary phloem and label B points to primary phloem. Label C points to the secondary growth tissues.

PTS: 1 DIF: L2 REF: p. 676
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e BLM: analysis

155. ANS:
Labels A, B, E, and F indicate structures that were formed by primary growth. Label A indicates the cortex, B indicates the primary phloem, E indicates the primary xylem, and F indicates the pith.

PTS: 1 DIF: L3 REF: p. 676 | p. 677
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e BLM: application

156. ANS:
Structure A, the cuticle, and structure D, the epidermis, protect the leaf from drying out. Structure E, the stoma, and structure G, the guard cells, also play roles in conserving water.

PTS: 1 DIF: L2 REF: p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c BLM: application

157. ANS:
Structure F is a leaf vein; its tissues, xylem and phloem, lack chlorophyll.

PTS: 1 DIF: L2 REF: p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c TOP: Foundation Edition
BLM: analysis

158. ANS:
The stomata, one of which is indicated by letter E, are open.

PTS: 1 DIF: L1 REF: p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c TOP: Foundation Edition

BLM: application

159. ANS:
The spaces connect with the stomata, allowing gases to be exchanged between the mesophyll cells and the atmosphere.

PTS: 1 DIF: L2 REF: p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c TOP: Foundation Edition
BLM: application

160. ANS:
Structure F is a leaf vein, which includes xylem and phloem.

PTS: 1 DIF: L2 REF: p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c TOP: Foundation Edition
BLM: application

161. ANS:
The arrows represent the movement of water through a plant.

PTS: 1 DIF: L2 REF: p. 685 | p. 686 | p. 687
OBJ: 23.5.1 Explain the process of water movement in a plant. STA: UT.BIO.2.3.d
TOP: Foundation Edition BLM: analysis

162. ANS:
Root pressure is helping to move water upward through part A.

PTS: 1 DIF: L1 REF: p. 685 | p. 686 | p. 687
OBJ: 23.5.1 Explain the process of water movement in a plant. STA: UT.BIO.2.3.d
TOP: Foundation Edition BLM: comprehension

163. ANS:
Transpiration is helping to bring water to the top of the plant.

PTS: 1 DIF: L1 REF: p. 685 | p. 686 | p. 687
OBJ: 23.5.1 Explain the process of water movement in a plant. STA: UT.BIO.2.3.d
TOP: Foundation Edition BLM: comprehension

164. ANS:
Capillary action causes water to move upward in part B.

PTS: 1 DIF: L1 REF: p. 685 | p. 686 | p. 687
OBJ: 23.5.1 Explain the process of water movement in a plant. STA: UT.BIO.2.3.d
TOP: Foundation Edition BLM: comprehension

165. ANS:
Xylem tissue transports water through a plant.

PTS: 1 DIF: L1 REF: p. 685 | p. 686 | p. 687
OBJ: 23.5.1 Explain the process of water movement in a plant. STA: UT.BIO.2.3.d
TOP: Foundation Edition BLM: comprehension

166. ANS:
J, the petal

PTS: 1 DIF: L2 REF: p. 696

OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: comprehension

167. ANS:
Labels F, G, and H point to male parts. Labels A, B, C, D, and E point to female parts.

PTS: 1 DIF: L3 REF: p. 696
OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: application

168. ANS:
F, the anther

PTS: 1 DIF: L2 REF: p. 696
OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: comprehension

169. ANS:
D, the stigma

PTS: 1 DIF: L2 REF: p. 696
OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: application

170. ANS:
the style

PTS: 1 DIF: L1 REF: p. 696
OBJ: 24.1.1 Identify the functions of various structures in a flower.
STA: UT.BIO.3.1.a | UT.BIO.3.1.c TOP: Foundation Edition
BLM: application

171. ANS:
pollen tube

PTS: 1 DIF: L2 REF: p. 701 | p. 700
OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a TOP: Foundation Edition
BLM: application

172. ANS:
There are eight nuclei in the embryo sac. They formed from a single haploid cell that underwent mitosis.

PTS: 1 DIF: L2 REF: p. 699
OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a BLM: application

173. ANS:
Endosperm is a triploid structure, which does not form in other kinds of plants.

PTS: 1 DIF: L3 REF: p. 700 | p. 701
OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a BLM: application

174. ANS:
The volume of the endosperm increases.

PTS: 1 DIF: L2 REF: p. 700 | p. 701
OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a BLM: application

175. ANS:
The pollen for the flower shown in Figure 24–6 is most likely dispersed by animals. The structure of the flower does not appear to facilitate pollen dispersal by wind.

PTS: 1 DIF: L3 REF: p. 700 | p. 701
OBJ: 24.1.2 Explain how fertilization differs between angiosperms and other plants.
STA: UT.BIO.4.1.a BLM: synthesis

176. ANS:
Chrysanthemum. A chrysanthemum blooms and produces seeds in the fall. Cytokinin is produced in developing seeds.

PTS: 1 DIF: L3 REF: p. 713 | p. 710
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
BLM: synthesis

177. ANS:
Phytochrome regulates the response to photoperiod. It causes the iris to bloom on long days, which take place in the summer.

PTS: 1 DIF: L2 REF: p. 713
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
BLM: application

178. ANS:
The chrysanthemum will bloom, but the bearded iris will not. The chrysanthemum is a short-day plant, and the bearded iris is a long-day plant.

PTS: 1 DIF: L2 REF: p. 713
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
BLM: application

179. ANS:
Chrysanthemums are adapted to blooming only when they have a long period of uninterrupted darkness. They are short-day plants.

PTS: 1 DIF: L2 REF: p. 713
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
BLM: application

180. ANS:
He or she grow should grow the plants inside and control photoperiod, exposing the plants to more light during wintertime and less light during summertime.

PTS: 1 DIF: L3 REF: p. 713
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
BLM: synthesis

ESSAY

181. ANS:
Over time, the carbon dioxide concentration would decrease and the oxygen content would increase. This happens because the plant takes in carbon dioxide for photosynthesis and releases oxygen, which is a byproduct of photosynthesis. Over time, the plant will use most or all of the carbon dioxide. Without carbon dioxide, the plant cannot continue photosynthesis. Eventually, it will die.

PTS: 1 DIF: L3 REF: p. 635
OBJ: 22.1.1 Describe what plants need to survive. STA: UT.BIO.2.2.b | UT.BIO.5.3.b
BLM: evaluation

182. ANS:
Land plants and multicellular green algae are both part of the plant kingdom. They both have cellulose-based cell walls and identical photosynthetic pigments. They also have similar reproductive cycles. These similarities suggest that plants evolved from an organism much like the multicellular green algae living today.

PTS: 1 DIF: L3 REF: p. 636 | p. 640
OBJ: 22.1.2 Describe how the first plants evolved. STA: UT.BIO.5.2.a
BLM: evaluation

183. ANS:
No, the angiosperms did not evolve from the gymnosperms. Rather, both the angiosperms and gymnosperms evolved from the same ancestral plant group. This group diverged and formed two distinct plant groups, the modern gymnosperms and the modern angiosperms. Angiosperms evolved more recently than gymnosperms.

PTS: 1 DIF: L3 REF: p. 636 | p. 637
OBJ: 22.1.2 Describe how the first plants evolved. STA: UT.BIO.5.2.a
BLM: evaluation

184. ANS:
The earliest plants were green algae and bryophytes, which require a great deal of water. Seedless vascular plants are also dependent on water. If Earth had stayed wet, these plants would likely still dominate Earth's ecosystems. Gymnosperms and angiosperms might not exist. The types of animals living on land today might also be different.

PTS: 1 DIF: L3 REF: p. 636 | p. 639 | p. 641 | p. 644
OBJ: 22.1.2 Describe how the first plants evolved. STA: UT.BIO.5.2.a
BLM: synthesis

185. ANS:
The term refers to the life cycle of plants in which a diploid sporophyte phase alternates with a haploid gametophyte phase. In green algae, some green algae do not alternate between the haploid phases in every generation; they may stay in the haploid phase for a long period of time. So, the haploid phase is dominant. In bryophytes, the gametophyte is larger than the sporophyte. In seedless vascular plants such as ferns, the gametophyte is smaller than the sporophyte. In seed plants, the sporophyte is the visible part of the plant and the gametophytes are tiny and hidden within the tissues of the sporophyte. In gymnosperms, the gametophytes are found inside cones. In angiosperms, they are found inside flowers.

PTS: 1 DIF: L3
REF: p. 637 | p. 638 | p. 640 | p. 642 | p. 644 | p. 648 | p. 649 | p. 650
OBJ: 22.1.3 Explain the process of alternation of generations. STA: UT.BIO.4.1.a
BLM: comprehension

186. ANS:

When a sperm fertilizes an egg in an archegonium of a gametophyte, a zygote is formed in the archegonium. The zygote is a sporophyte that grows directly out of the gametophyte.

PTS: 1 DIF: L2 REF: p. 642
OBJ: 22.2.2 Describe the adaptations of bryophytes. STA: UT.BIO.5.3.b
BLM: comprehension

187. ANS:
Vascular tissue allows water and dissolved nutrients to move throughout the plant body more efficiently than by osmosis alone. As a result, plants with vascular tissue do not have to grow close to the ground and can become larger in size. Also, lignin in the cell walls of vascular tissue supports the plant.

PTS: 1 DIF: L2 REF: p. 643
OBJ: 22.2.3 Explain the importance of vascular tissue. STA: UT.BIO.5.2.a | UT.BIO.5.3.b
TOP: Foundation Edition BLM: comprehension

188. ANS:
The embryo in the fern's archegonium is analogous to the embryo in a seed. Both are diploid and grow into a mature sporophyte. However, the embryo in a seed is protected by a seed coat and is surrounded by a food supply. The fern embryo is not. As a result, the embryo in the seed may not grow until conditions are favorable. The fern embryo dies if conditions are unfavorable.

PTS: 1 DIF: L3 REF: p. 645 | p. 646 | p. 647
OBJ: 22.3.1 Describe the reproductive adaptations of seed plants.
STA: UT.BIO.4.1.a | UT.BIO.5.2.a | UT.BIO.5.3.b BLM: synthesis

189. ANS:
Both angiosperms and gymnosperms are vascular plants that produce seeds. The gametophytes of angiosperms and gymnosperms grow and mature within the sporophyte. In gymnosperms, the gametophytes are in cones. In angiosperms, the gametophytes are in flowers. In both gymnosperms and angiosperms, the male gametophyte is a pollen grain. In gymnosperms, the pollen grain is transferred to the female gametophyte by wind. In angiosperms, the pollen grain is transferred to the female gametophyte by wind or animals. In gymnosperms, the seeds that result from pollination are formed on the surfaces of cone scales. In angiosperms, the seeds are formed in flowers. In angiosperms, a protective tissue called an ovary covers a seed. The ovary develops into a fruit.

PTS: 1 DIF: L2 REF: p. 645 | p. 646 | p. 648 | p. 650 | p. 651
OBJ: 22.3.1 Describe the reproductive adaptations of seed plants.
STA: UT.BIO.4.1.a | UT.BIO.5.2.a | UT.BIO.5.3.b TOP: Foundation Edition
BLM: analysis

190. ANS:
Some animals, such as bees, are attracted to flowers. They transfer male gametophytes (pollen grains) to the structures that house female gametophytes. Animals also help to disperse seeds by picking up seeds on their fur or feathers or by eating fruits and the seeds inside them and then passing the seeds out of their bodies, usually some distance from the parent plant.

PTS: 1 DIF: L2 REF: p. 647 | p. 651
OBJ: 22.4.1 Identify the reproductive structures of angiosperms.
STA: UT.BIO.5.3.b TOP: Foundation Edition
BLM: analysis

191. ANS:

From the soil, roots absorb water, which is used for photosynthesis in the leaves, and nutrients, which the leaves need for growth. The stem transports the water and nutrients from the roots to the leaves. The stem also holds the leaves up to the sun, allowing them to absorb sunlight for photosynthesis.

PTS: 1 DIF: L2 REF: p. 664
OBJ: 23.1.1 Identify the principal organs of seed plants. STA: UT.BIO.3.1.b
BLM: synthesis

192. ANS:
A primary function of parenchyma cells in leaves is photosynthesis; collenchyma cells support a plant; sclerenchyma cells support and protect parts of the plant.

PTS: 1 DIF: L2 REF: p. 667
OBJ: 23.1.2 Explain the primary functions of the main tissue systems of seed plants.
STA: UT.BIO.3.1.a | UT.BIO.3.2.d BLM: analysis

193. ANS:
The cell membranes of root hairs and other cells in the root epidermis contain active transport proteins. These proteins use ATP to pump mineral ions from the soil into the plant. The high concentration of mineral ions in the plant cells causes water molecules to move into the plant by osmosis.

PTS: 1 DIF: L2 REF: p. 672
OBJ: 23.2.2 Describe the different functions of roots.
STA: UT.BIO.2.3.c | UT.BIO.3.1.b | UT.BIO.3.1.c BLM: comprehension

194. ANS:
Stems produce leaves, branches, and flowers; they hold leaves up to the sunlight; and they transport substances between roots and leaves.

PTS: 1 DIF: L1 REF: p. 674
OBJ: 23.3.1 Describe the main functions of stems.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c | UT.BIO.3.2.d TOP: Foundation Edition
BLM: comprehension

195. ANS:
The height of a tree increases only at the tip of the trunk (stem), where the apical meristem is located. There is no increase in length along the rest of the trunk. Thus, the nail remains at that same height for the lifetime of the tree.

PTS: 1 DIF: L3 REF: p. 668 | p. 676 | p. 677
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e BLM: comprehension

196. ANS:
During primary growth, cells in the apical meristems elongate, making the plant taller or longer. In secondary growth, cell growth in the vascular cambium and cork cambium make the plant wider.

PTS: 1 DIF: L2 REF: p. 676 | p. 677
OBJ: 23.3.2 Contrast the processes of primary growth and secondary growth in stems.
STA: UT.BIO.2.3.e TOP: Foundation Edition
BLM: analysis

197. ANS:

Mesophyll cells contain chloroplasts and carry out nearly all of the photosynthetic activity of the plant. The mesophyll is composed of the palisade mesophyll, which consists of closely packed cells that absorb much of the light that enters the leaf. The spongy mesophyll consists of loosely packed cells separated by spaces. The spaces in this layer connect with stomata, which allow gases to pass in and out of the leaf.

PTS: 1 DIF: L2 REF: p. 680 | p. 681
OBJ: 23.4.1 Describe how the structure of a leaf enables it to carry out photosynthesis.
STA: UT.BIO.3.1.b | UT.BIO.3.1.c BLM: analysis

198. ANS:
When a plant is watered, the plant takes in the water through its roots. The water then travels to the leaves. There, the water moves by osmosis into the guard cells, increasing the pressure in the cells. The increased pressure causes the thin outer walls of the guard cells to become curved, pulling the thick inner walls of the guard cells away from each other. This movement of the inner walls of the guard cells causes the stomata to open.

PTS: 1 DIF: L3 REF: p. 682 | p. 683
OBJ: 23.4.2 Explain how gas exchange in leaves relates to homeostasis.
STA: UT.BIO.2.3.c BLM: comprehension

199. ANS:
The stomata would be closed during periods of low rainfall, high temperature, and intense light, because all three conditions increase a plant's need to conserve water. Stomata would also be closed at night. Low rainfall decreases the amount of water available to a plant through its roots. High temperatures increase the amount of water that evaporates from a plant's leaves. Intense light increases photosynthesis, which increases the use of water by the plant. At night, there is no photosynthesis, so open stomata would only lead to water loss. Closed stomata help conserve water under all these conditions.

PTS: 1 DIF: L3 REF: p. 682 | p. 683
OBJ: 23.4.2 Explain how gas exchange in leaves relates to homeostasis.
STA: UT.BIO.2.3.c BLM: synthesis

200. ANS:
Some roots store sugars or starches. During periods of decreased photosynthesis, carbohydrates stored in the roots move up from the roots through the phloem to the leaves. The plant can then use these carbohydrates for life functions. In this case, the source cells are in the roots, and the sink cells are in the leaves.

PTS: 1 DIF: L3 REF: p. 687
OBJ: 23.5.2 Describe how the products of photosynthesis are transported throughout a plant.
STA: UT.BIO.2.2.b BLM: synthesis

201. ANS:
Vegetative reproduction produces plants more quickly than fertilization, seed production, and germination do. Vegetative reproduction also ensures that new plants are genetically identical to the parent plant, so the plants will have the desired traits. This might not be the case if parent plants were pollinated.

PTS: 1 DIF: L3 REF: p. 702 | p. 703
OBJ: 24.1.3 Describe vegetative reproduction. STA: UT.BIO.4.1.b
BLM: evaluation

202. ANS:
After fertilization, nutrients flow into the flower tissue and support the development of the growing embryo within the seed. As the seed matures, the ovary wall thickens to form the fruit that surrounds the seeds.

PTS: 1 DIF: L2 REF: p. 704

OBJ: 24.2.1 Describe the development of seeds and fruits. STA: UT.BIO.5.1.a
TOP: Foundation Edition BLM: application

203. ANS:
A large, tasty fruit is likely to be eaten by an animal, and the seeds of the plant will be dispersed away from the parent plant in the animal's feces. Because seeds are dispersed away from the parent plant, the new plant will be less likely to face competition from its parent. Thus, it is more likely that the plant will survive and pass on its genetic material to its offspring.

PTS: 1 DIF: L2 REF: p. 705
OBJ: 24.2.2 Explain how seeds are dispersed. STA: UT.BIO.5.1.a
BLM: synthesis

204. ANS:
The seeds of some pine species are enclosed in sealed cones, which open only after being exposed to the heat of a forest fire. When the cones open, the seeds come out of dormancy and germinate. This process allows the pines to recover quickly after a fire.

PTS: 1 DIF: L3 REF: p. 707
OBJ: 24.2.3 List the factors that influence the dormancy and germination of seeds.
STA: UT.BIO.5.1.a BLM: synthesis

205. ANS:
The seed will germinate only in conditions that could support the growing plant. In areas where favorable conditions occur infrequently, seeds that can stay dormant for a long period of time are more likely to survive.

PTS: 1 DIF: L2 REF: p. 706
OBJ: 24.2.3 List the factors that influence the dormancy and germination of seeds.
STA: UT.BIO.5.1.a BLM: analysis

206. ANS:
Fruit tissues produce ethylene, a hormone that ripens fruit. Growers often use ethylene to ripen fruit after harvest. Sealing fruit in a bag would hold in the ethylene that the fruit produces and would help the fruit ripen faster.

PTS: 1 DIF: L3 REF: p. 711
OBJ: 24.3.1 Describe the effects of hormones on plant growth and development.
STA: UT.BIO.2.3.e BLM: synthesis

207. ANS:
If a gardener snips off the tip of a growing plant, the apical meristem will be removed. Auxin from the apical meristem will stop inhibiting the auxin production in the lateral meristems. The buds will begin to develop new branches, and the plant will take on a new shape that is rounder and fuller. The gardener has interrupted apical dominance.

PTS: 1 DIF: L2 REF: p. 710
OBJ: 24.3.1 Describe the effects of hormones on plant growth and development.
STA: UT.BIO.2.3.e BLM: comprehension

208. ANS:
The tendency of a plant to grow toward light is phototropism. During phototropism, the plant shoot tends to grow toward light. The growth response toward or against the force of gravity is gravitropism. The plant shoot tends to grow away from the force of gravity while the plant root grows toward the force of gravity. Responses to light and gravity are regulated and controlled by varying concentrations of auxins, which are produced in the plant's apical meristems.

PTS: 1 DIF: L2 REF: p. 712
OBJ: 24.3.2 Identify three tropisms exhibited in plants. STA: UT.BIO.2.3.e
BLM: comprehension

209. ANS:
Winter conditions could threaten the survival of many plants. These plants are protected by dormancy. The plant's leaves drop, nutrients are transported from leaves to roots for storage, and the terminal buds and meristems become coated with a thick, protective, waxy scale. Chemical changes take place in the xylem and phloem to keep the plant's sap from freezing. These changes help the plant survive the below-freezing temperatures of winter.

PTS: 1 DIF: L3 REF: p. 714
OBJ: 24.3.3 Describe how plants respond to seasonal change. STA: UT.BIO.2.3.e
BLM: application

210. ANS:
Humans have improved the yield of plants through selective breeding. In selective breeding, humans select desirable characteristics and make sure those get passed on to offspring. Over time, humans have been able to develop larger fruits and seeds as well as plants that produce more fruits and seeds. Technology has also played a role in the development of higher yields. Artificial fertilizers can be used to produce higher yields, and pesticides can be used to prevent the loss of crops to insects and other pests, resulting in higher yields.

PTS: 1 DIF: L2 REF: p. 716 | p. 717
OBJ: 24.4.1 Identify the major food-supply crops for humans. STA: UT.BIO.5.1.d
BLM: analysis